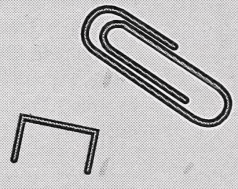
AL.2.2003-22

University of Alberta Library
0 1620 3409947 1

Pure MATHEMATICS 30

Module 1
Transformations
ASSIGNMENT BOOKLET 1A



Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Marks
Section 1 Assignment	40	

Teacher's Comments

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Parents	
General Public	
Other	

Pure Mathematics 30
Module 1: Transformations
Assignment Booklet 1A
Section 1 Assignment
Learning Technologies Branch
ISBN 0-7741-1632-3

ALL RIGHTS RESERVED

Copyright © 2000, the Crown in Right of Alberta, as represented by the Minister of Learning, Alberta Learning, 11160 Jasper Avenue, Edmonton, Alberta T5K 0L2. All rights reserved. Additional copies may be obtained from the Learning Resources Distributing Centre.

No part of this courseware may be reproduced in any form, including photocopying (unless otherwise indicated), without the written permission of Alberta Learning.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Learning so that appropriate corrective action can be taken.

IT IS STRICTLY PROHIBITED TO COPY ANY PART OF THESE MATERIALS UNDER THE TERMS OF A LICENCE FROM A COLLECTIVE OR A LICENSING BODY.

UNIVERSITY LIBRARY
UNIVERSITY OF ALBERTA

ASSIGNMENT BOOKLET 1A
PURE MATHEMATICS 30: MODULE 1
SECTION 1 ASSIGNMENT

Your mark for this module will be determined by how well you do your assignments in the Assignment Booklets.

This Assignment Booklet is worth 40 marks out of the total 100 marks for Module 1.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

(40)

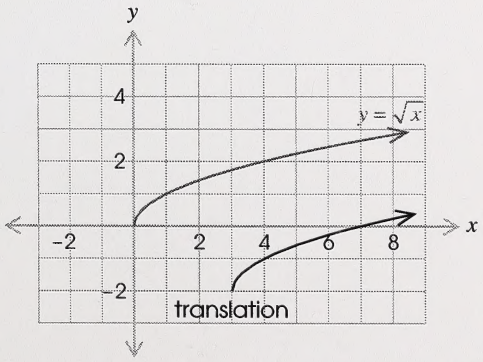
Section 1 Assignment: Transformations

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

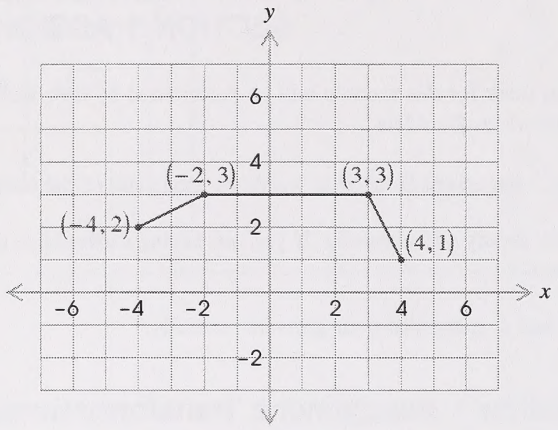
(1) **1.** Describe how the graph of $y-2=f(x)$ can be obtained from the graph of $y=f(x)$.

(1) **2.** Explain how the graphs of $y=f(x)$ and $y=f(x+4)$ are related.

(2) **3.** The graph of $y=\sqrt{x}$ and a translation of this graph are shown. Write the equation of the translated graph.



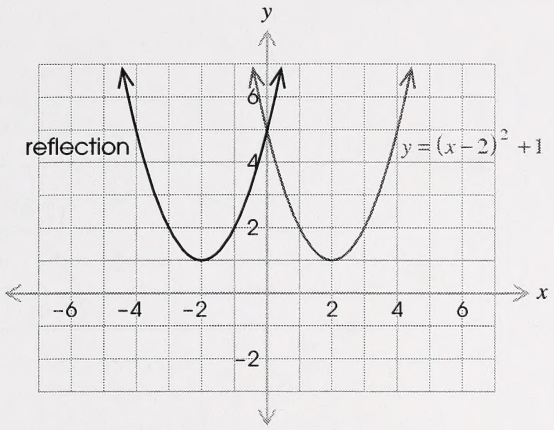
(2) **4. a.** The graph of $y = f(x)$ is shown. On the same grid, graph $y + 2 = f(x - 2)$.



(1) **b.** Explain how you obtained the graph in 4.a.

(3) **5.** A horizontal translation is applied to the graph of $y = x^3 + 2$ so that it will pass through $(3, 10)$. What is the new equation of the graph?

6. The graphs of $y=(x-2)^2+1$ and its reflection in the y-axis are given.



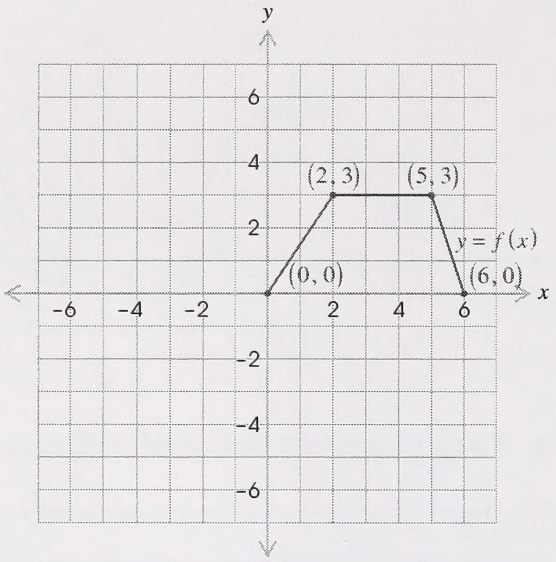
(1) **a.** What is the equation of the reflected graph?

(1) **b.** Explain how the equation of the reflected graph can be obtained by applying a horizontal translation to the graph of $y=(x-2)^2+1$.

(3) **c.** Demonstrate algebraically that the equations obtained in 6.a. and 6.b. are equivalent.

(4)

7. Draw the graphs of $y = -f(x)$ and $y = f(-x)$ on the same grid as $y = f(x)$. Clearly identify each graph.

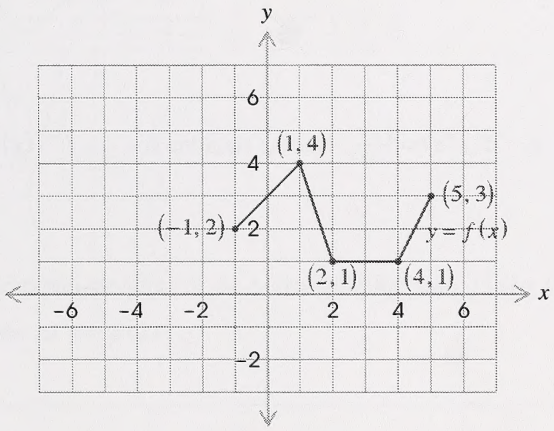


(2)

8. a. How are the graphs of $y = x^2 - 3x$ and $y = 3x - x^2$ related? Justify your answer.

(2) **b.** What points do the graphs of $y = x^2 - 3x$ and $y = 3x - x^2$ have in common? Explain.

(2) **9. a.** Draw the graph of $x = f(y)$ on the same axes as $y = f(x)$.

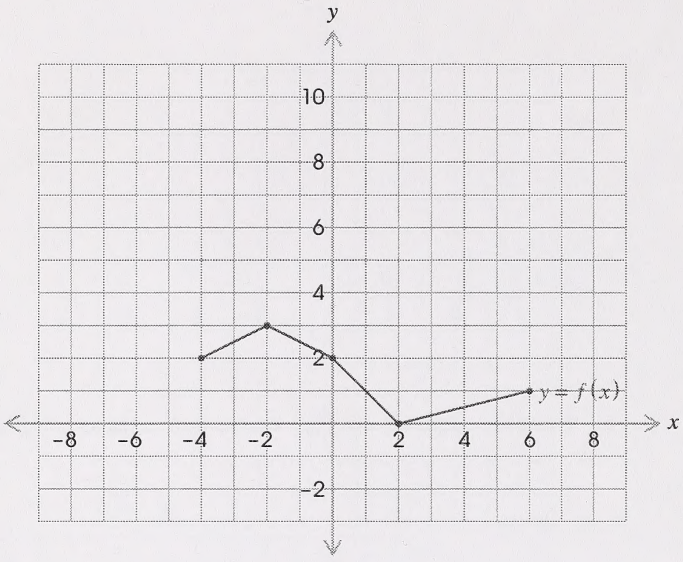


(1) **b.** How are the graphs of $y = f(x)$ and $x = f(y)$ related?

_____

_____

(4) **10.** Draw the graphs of $y = f(2x)$ and $y = 3f(x)$ on the same grid as $y = f(x)$. Clearly identify your graphs.



(2) **11. a.** If $f(x) = \frac{2x-1}{x+2}$, find the equation for $y = f^{-1}(x)$.

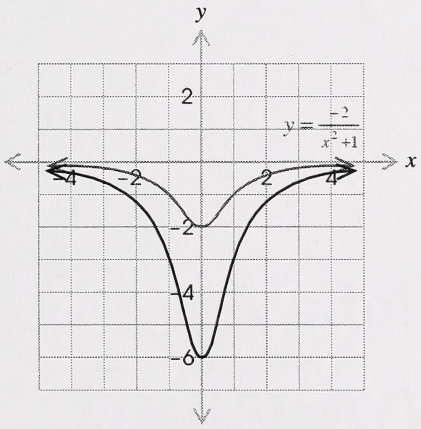
(1) **b.** On which line do points that are common to the graphs of both functions in 11.a. lie?

_____

_____

(2) **12.** Describe how the graph of $y = 2f(4x)$ can be obtained from the graph of $y = f(x)$.

(2) **13.** The graph of $y = \frac{-2}{x^2+1}$ has been stretched to obtain a second graph. What is the equation of the second graph? Justify your answer.



(3) **14.** Use transformations and the zeros of the polynomial function $f(x) = x(x-4)(x+2)$ to determine the zeros of $y = f(2x)$.

Pure Mathematics 30
Assignment Booklet 1A
Module 1

LRDC

2000

AL.2.2003-22
NO ILL
c.2 v.1 (b)

Pure MATHEMATICS 30

Module 1
Transformations
Assignment Booklet 1B

Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 2 Assignment	40	
Final Module Assignment	20	
	60	

Teacher's Comments

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Parents	
General Public	
Other	

Pure Mathematics 30
Module 1: Transformations
Assignment Booklet 1B
Section 2 Assignment and Final Module Assignment
Learning Technologies Branch
ISBN 0-7741-1731-1

ALL RIGHTS RESERVED

Copyright © 2000, the Crown in Right of Alberta, as represented by the Minister of Learning, Alberta Learning, 11160 Jasper Avenue, Edmonton, Alberta T5K 0L2. All rights reserved. Additional copies may be obtained from the Learning Resources Distributing Centre.

No part of this courseware may be reproduced in any form, including photocopying (unless otherwise indicated), without the written permission of Alberta Learning.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Learning so that appropriate corrective action can be taken.

IT IS STRICTLY PROHIBITED TO COPY ANY PART OF THESE MATERIALS UNDER THE TERMS OF A LICENCE FROM A COLLECTIVE OR A LICENSING BODY.

ASSIGNMENT BOOKLET 1B
PURE MATHEMATICS 30: MODULE 1
SECTION 2 ASSIGNMENT AND FINAL MODULE ASSIGNMENT

Your mark for this module will be determined by how well you do your assignments in the Assignment Booklets.

This Assignment Booklet is worth 60 marks out of the total 100 marks for Module 1.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

(40)

Section 2 Assignment: Graphing

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

1. Describe how the graph of each of the following functions can be obtained from the graph of $y = f(x)$.

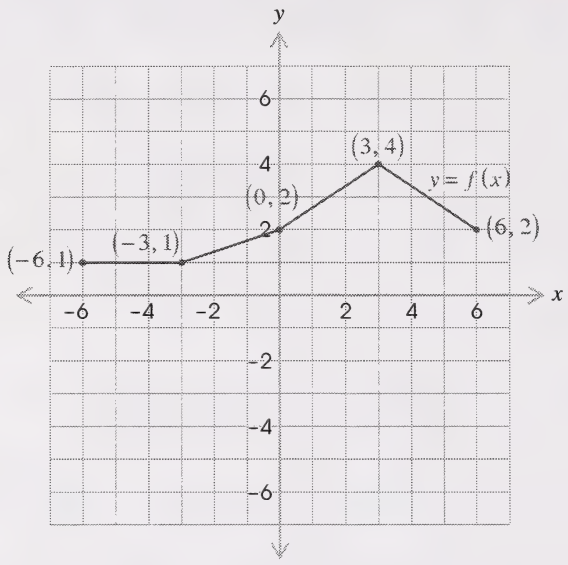
(4)

a. $y = -2f(x-1)+3$

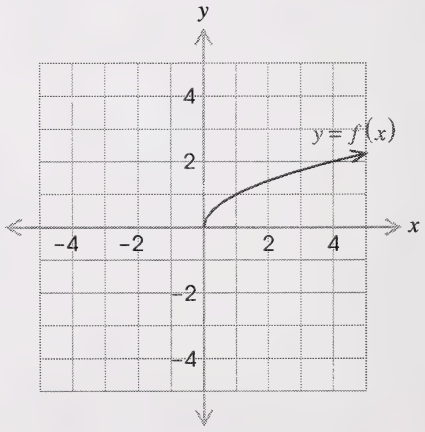
(4)

b. $y = 2f(-3x+12)$

(4) **2.** The graph of $y = f(x)$ is shown. On the same set of axes, graph $y = f(3x) - 2$.

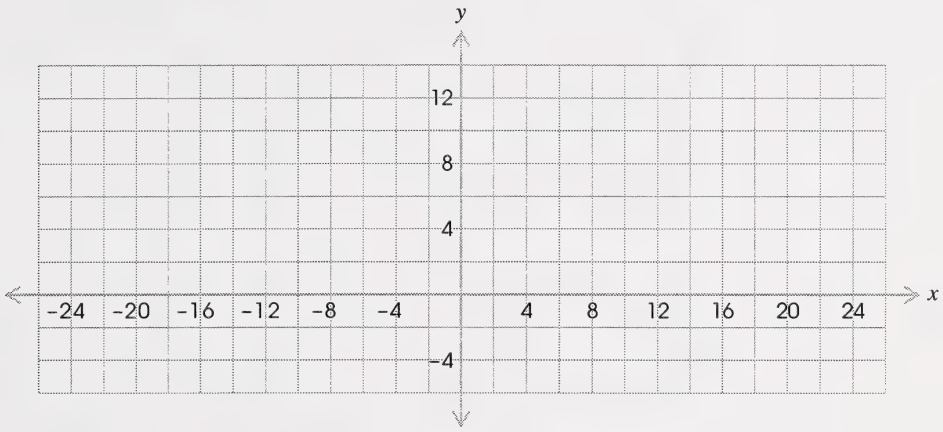


(4) **3.** Given $f(x) = \sqrt{x}$, draw the graph of $y = -2f(-x+3)+1$ and describe the transformation $f(x)$ undergoes.



4. The cross section of the roof of a house is modelled by the function $y = -\frac{5}{12}|x - 12| + 5$, where $y \geq 0$.

(3) **a.** Graph the function.



(3) **b.** Find the height and length of each side (including the base) of the isosceles triangle.

(2) **c.** What is the slope of the roof?

_____

_____

_____

(4)

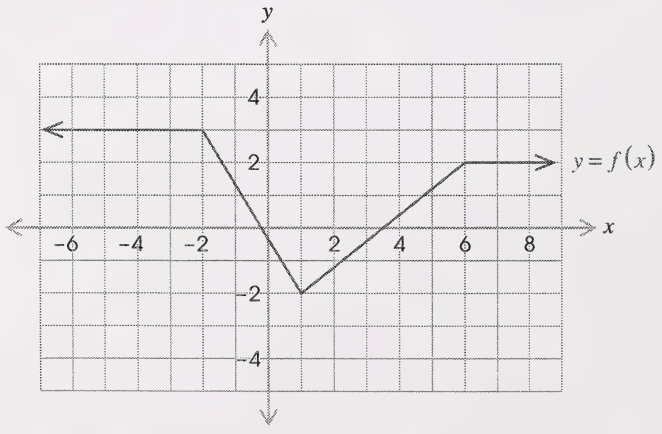
d. What transformations must be applied to the graph of $y=|x|$ to obtain the graph of $y=-\frac{5}{12}|x-12|+5$, where $y\geq 0$?

(4)

5. The graph of $f(x)=|x|$ is compressed vertically by a factor of $\frac{1}{2}$, then reflected in the x-axis, and then translated 4 units to the right and 5 units down. Write the equation of the transformed function, $y=g(x)$.

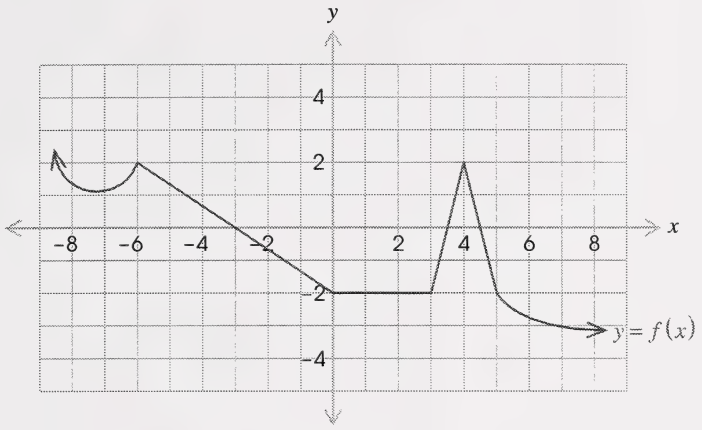
(5)

6. Using the graph of $y=f(x)$, draw the graph of $y=\frac{1}{f(x)}$ on the same axes.



(3)

7. Using the graph of $y = f(x)$, draw $y = |f(x)|$ on the same axes.



(20)

Final Module Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

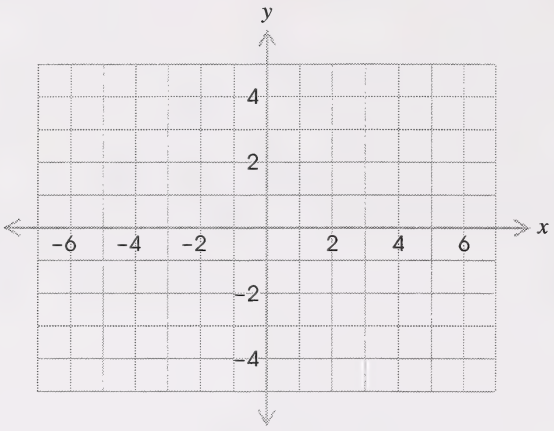
(3)

1. Describe how the graph of $y = f(-2x+6)+7$ can be obtained from the graph of $y = f(x)$.

(3)

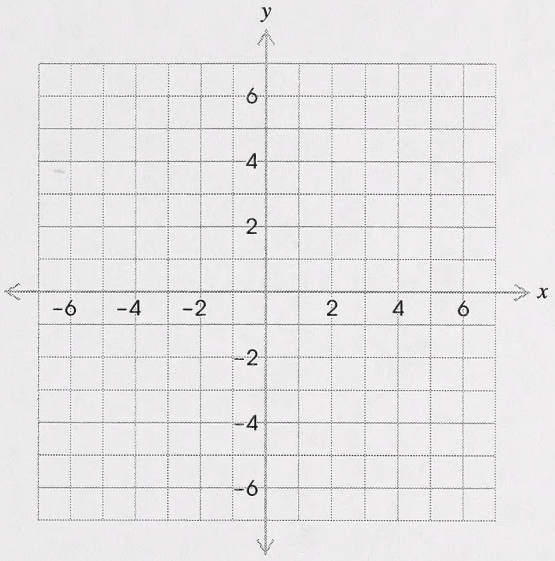
2. The graph of $f(x) = x^3$ is expanded horizontally by a factor of 2, then reflected in the y-axis, and then translated 3 units to the left and 1 unit down. Write the equation of the transformed function, $y = g(x)$.

(4) **3. a.** Draw the graphs of $f(x)=x^2-4x$ and $g(x)=\frac{1}{f(x)}$ on the same grid.



(4) **b.** Explain how the graph of $f(x)=x^2-4x$ can be used to obtain the graph of $y=g(x)$.

(2) **4. a.** Draw the reflection of $f(x)=\sqrt{x-2}$ in the line $y=x$.



(3) **b.** Write the equation of the reflection in the form $y = g(x)$.

(1) **c.** Is $y = g(x)$ a function? Justify your answer.

Pure Mathematics 30
Assignment Booklet 1B
Module 1
2000
LRDC